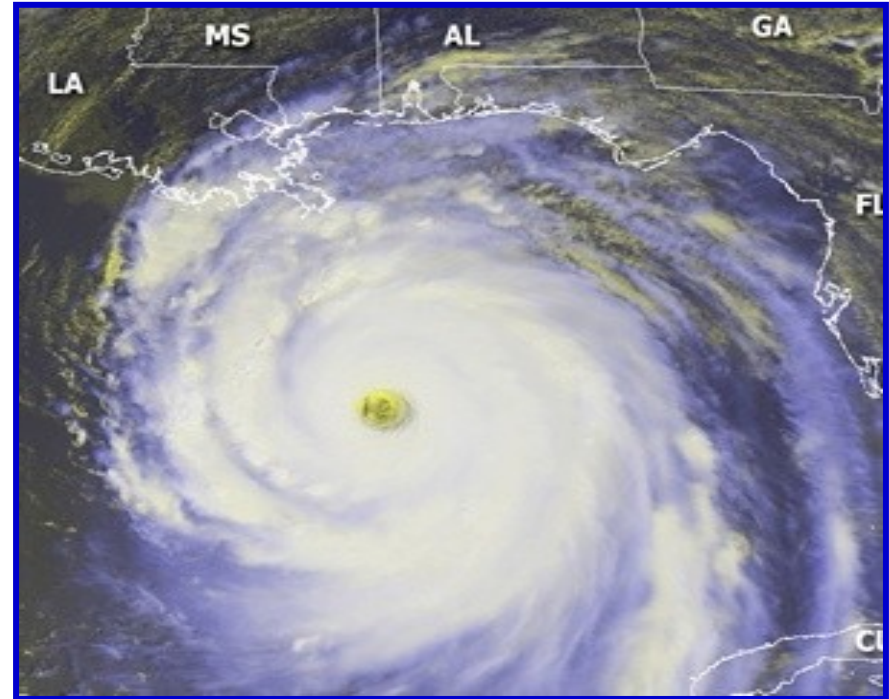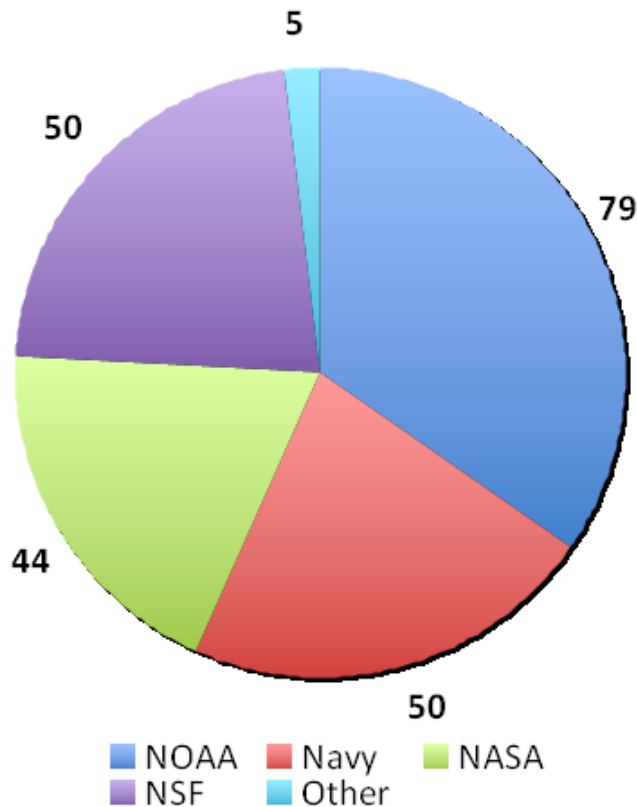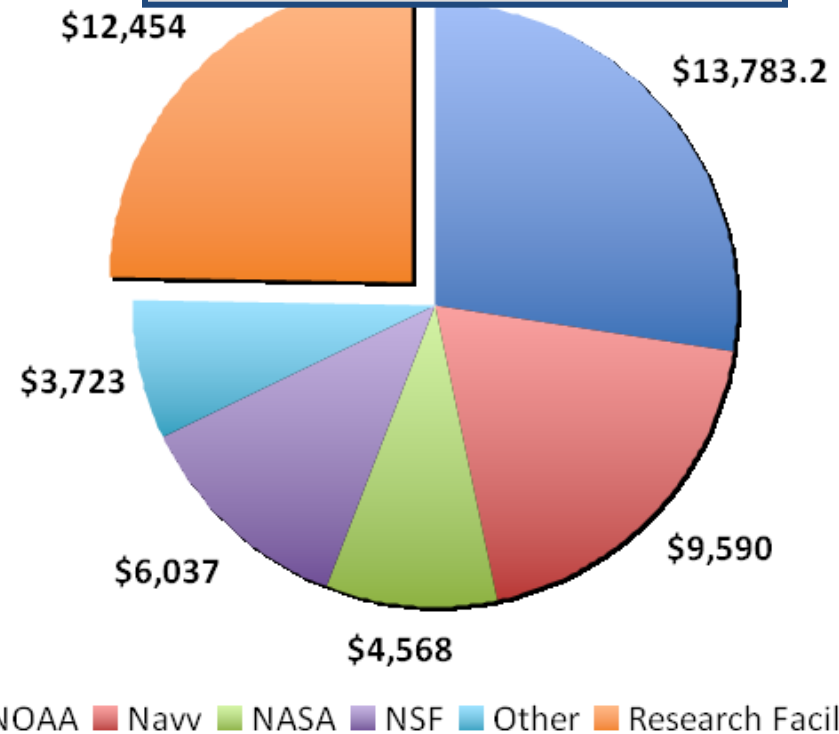# 2009 IHC:
WG/TCR Workshop
Wrap-up

Workshop: Identifying Tropical Cyclone Research Needs, Progress and Gaps

Combined Man-Years & $ Included in Study

Total Man-Years:
228

Total $
With Facilities:
$50.2M
Without Facilities:
37.7M

5
50
79
44
50

NOAA   Navy   NASA
NSF   Other

$12,454
$13,783.2
$3,723
$9,590
$6,037
$4,568

NOAA   Navy   NASA   NSF   Other   Research Facilities
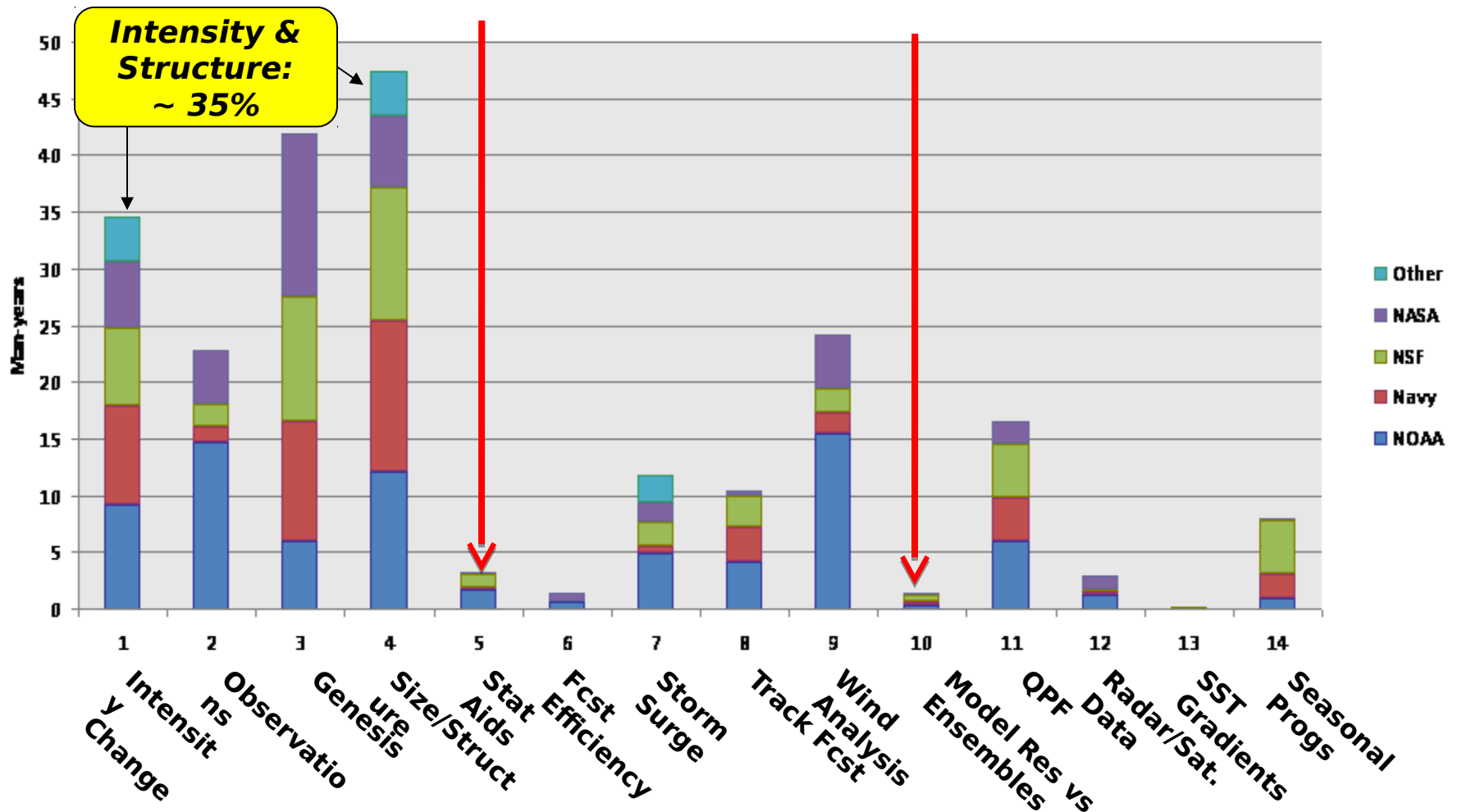
Combined Man-Years vs Research Category
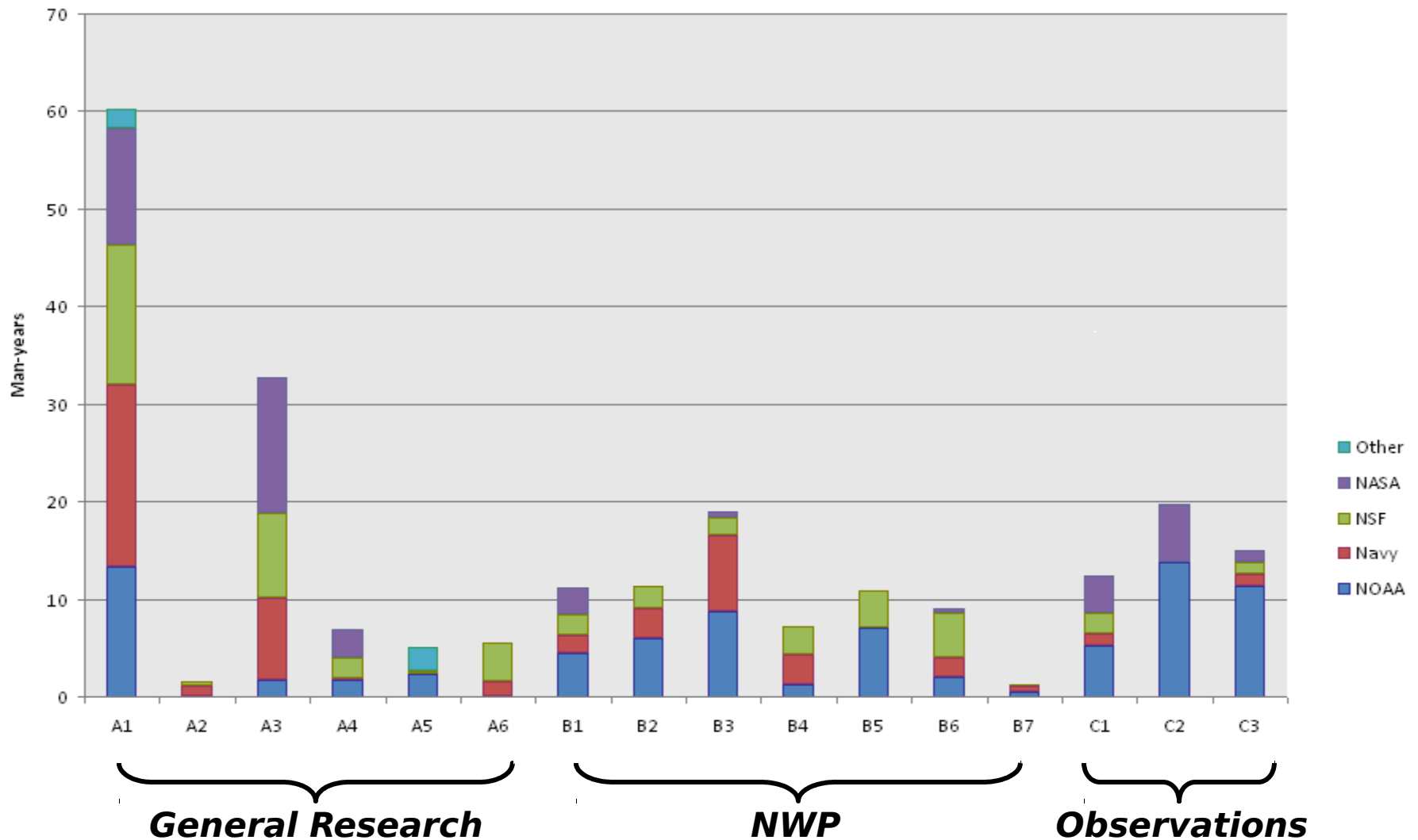
Combined Man-Years Mapped to JTWC Priorities

TC Research Roughly Aligned with Operational Priorities

Intensity & Structure: ~ 35%

Man-years axis: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50

Legend: Other (teal), NASA (purple), NSF (green), Navy (red), NOAA (blue)

Categories:
1. Intensity Change
2. Observations
3. Genesis
4. Size/Structure
5. Stat Aids
6. Fcst Efficiency
7. Storm Surge
8. Track Fcst
9. Wind Analysis
10. Model Res vs Ensembles
11. QPF
12. Radar/Sat. Data
13. SST Gradients
14. Seasonal Progs

Summary

- **Snapshot analysis of all agency research efforts mapped against research needs and operational priorities**

  - **Fairly even distribution of TC research investment among agencies cover most operational priorities**

  - **Intensity/structure change #1, but very difficult**

  - **Captures >90% research in 75 IHC abstracts**

  - **Work in progress**

Summary

- **Areas of Concern / Gaps**
  - **Little emphasis on forecaster aids (guidance on guidance)**
    - **Not just an applied research problem**
    - **Needs greater emphasis in basic as well as applied**
    - **Include math / probability community**
  - **Little emphasis on resolution vs. ensemble model output***

* First HFIP issue

Summary

- **Areas of Concern / Gaps (continued)**
  - **Continue global model improvement (NUOPC)**
  - **Major Concern / Gap**
    - **Lack of inclusion of social science and associated decision-making issues related to TC research**

Summary

- **Next steps of WG/TCR**

  - **Develop set of interagency strategic objectives driven by requirements (intensity/structure, track, RI, genesis)**

  - **Relate research efforts toward achieving strategic objectives**

  - **Document continued work of WG/TCR**

  - **Formalize executive oversight**

  - **Address major concern to address social science and decision-making issues**

Track Error Comparison

Parameter	24hrs	48hrs	72hrs	96hrs	120hrs
Orig MGPACOM	50nm	100nm	150nm	n/a	n/a
JTWC 5yr avg	65nm	110nm	165nm	224nm	301nm
NHC 5yr avg	64nm	113nm	163nm	221nm	286nm
HFIP	32nm	55nm	82nm	110nm	143nm
New?	***30nm***	***60nm***	***90nm***	***120nm***	***150nm***

Capability Gain **76K sq. nm**   **210K sq. nm**   **495K sq. nm (Texas is 267K)**

*based on avg TC restricting c. 283K sq. mi

Action: New DoD Strategic Objectives?

Notional Measures and Objectives

Parameter	12hrs	24hrs	48hrs	72hrs	96hrs	120hrs
Track	30nm	45nm	60nm	90nm	120nm	150nm
Intensity	n/a	0.5T	1.0T	1.5T	Class	Class
Gale Radius	xxx	xxx	30nm	45nm	60nm	90nm
Genesis	95%	90%	75%	50%	--	--

Recommended Criteria:
• Tied to Operational capability
• Sufficiently challenging to guide research
• Interagency (where feasible)
• Verifiable—*Ocean Surface Vector Winds?*